

Simulating Emerging Space Industries with Agent-Based Modeling, Phase I

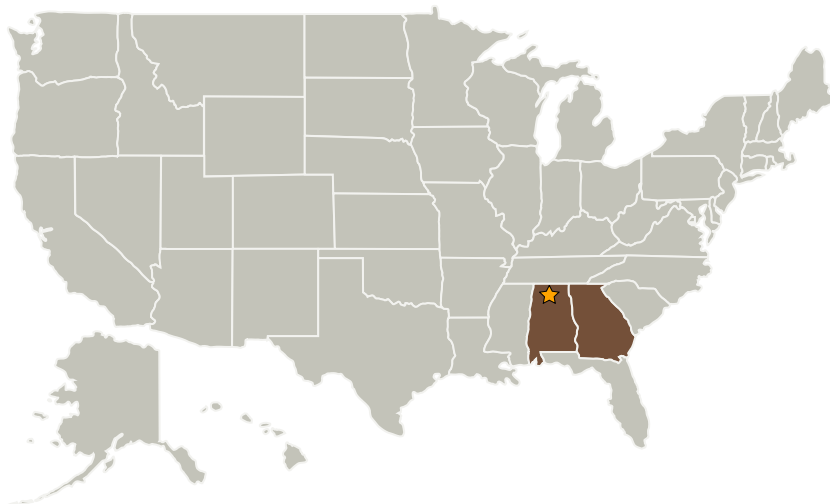
Completed Technology Project (2006 - 2006)



Project Introduction

The Vision for Space Exploration (VSE) calls for encouraging commercial participation as a top-level objective. Given current and future commercial activities, how should the government satisfy this objective? How can simulation of future companies determine the most likely to emerge? This innovation seeks to answer such questions envisioning a diverse set of four possible future space companies (orbital habitats/hotels, orbital tourist delivery, propellant depots, lunar excursion tourism, and lunar In-Situ Resource Utilization), examining their business case in spreadsheet-based models (both deterministically and probabilistically), modeling them in a higher fidelity agent-based modeling (ABM) environment (that is new to the aerospace industry but has been used by the authors of the proposal), determining the impact on a company's financial bottom-line, and finding potential cost savings to the government of using those products and services in future space exploration activities. Phase I will entail basic research of each of the four of case studies (or companies) as they are referred to here, spreadsheet-based modeling and analysis of each case study, and preliminary definition of the behaviors required for agent-based modeling. Phase II will entail development of a high fidelity, agent-based model of each company, their competitors, and their customers (commercial and the government).

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Marshall Space Flight Center (MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
SpaceWorks Enterprises, Inc. (SEI)	Supporting Organization	Industry	Atlanta, Georgia

Primary U.S. Work Locations

Alabama	Georgia
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.4 Vehicle Systems
 - └ TX09.4.5 Modeling and Simulation for EDL